REMARKS

Claims 1-49 are currently pending in the present application, with Claims 1, 3, 10, 12, 13, 18, 25-27, 40-42, and 47 being amended, and Claim 49 being added. Reconsideration and reexamination of the claims are respectfully requested.

The Examiner objected to Claim 42 due to reasons of informalities. Applicants have amended Claim 42 to make the necessary corrections.

The Examiner rejected Claims 27-30, 32, 33, 35, 36, and 40 under 35 U.S.C. § 102(b) as being anticipated by Miyake (U.S. Patent No. 5,256,832). This rejection is respectfully traversed with respect to the amended claims.

Claim 27 (and corresponding apparatus Claim 40) recites a method for analyzing waveform data. More specifically, waveform data is stored in parallel to the reproduction of automatic performance information, along with the storing of a series of synchronization control data indicating a timing relationship between the automatic performance to be executed and the waveform data to be sampled. The recited method makes possible to reproduce the recorded waveform data while maintaining appropriate synchronism with the automatic performance. Miyake does not contain any disclosure of storing a series of synchronization control data indicative of a timing relationship between an automatic performance and pre-stored waveform data. Rather, Miyake discloses detecting beat positions from among digital audio signals of a performance part, where tones with strong beat components (such as a base drum) are recorded, and where MIDI clocks are generated to cause an electronic musical instrument to execute an automatic performance in accordance with the generated MIDI clock. No mention of synchronization control data is made or suggested in Miyake. Accordingly, Applicants respectfully submit that amended Claims 27-40 are not anticipated by, nor obvious in view of, Miyake.

The Examiner rejected Claims 41-48 under 35 U.S.C. § 102(b) as being anticipated by Katoh (U.S. Patent No. 4,794,837). This rejection is respectfully traversed with respect to the amended claims.

Claims 41-48 are directed to a method of processing waveforms. Specifically, Claim 41 recites a method of processing waveform data in which the original waveform data is divided into multiple partial waveform data, and an additional section is added to the tail end of each of the partial waveform data to as to attenuate the partial waveform over time. The modified partial waveform data is then stored in a storage device. By dividing the original waveform data into multiple partial waveform data and attaching additional sections to each of the partial waveform data, time-axial contraction/expansion of the original waveform can be realized.

Katoh does not contain any disclosure or suggestion of dividing an original waveform data into a plurality of partial waveform data, and adding attenuating additional sections to the tail end of each of the partial waveform data. Rather, Katoh is directed to interconnecting a PCM waveform and a DPCM waveform. The disclosed waveform connection is directed to interconnecting two different waveform data, and does not teach adding additional sections to each of the partial waveform data divided form an original waveform data.

With respect to Claim 43, Katoh simply does not suggest or teach adding or not adding additional sections to a divided waveform section in accordance with the particular tempo is used. Specifically, Katoh does not contain any disclosure of the feature wherein, when a reproducing tempo is faster than a predetermined tempo, the waveform data of the divided sections are used to reproduce a waveform without the additional section, and when the reproducing tempo is slower than the predetermined tempo, additional sections are added to the tail end of the waveform data of the divided sections. Accordingly, Applicants respectfully submit that Claims 41-48 are not anticipated by, nor obvious in view of, Katoh.

The Examiner rejected Claims 1-26 under 35 U.S.C. § 103(a) as being unpatentable over Yamada et al. (U.S. Patent No. 5,614,687) in view of Miyake (U.S. Patent No. 5,256,832). This rejection is respectfully traversed with respect to the amended claims.

Claims 1, 2, 8, and 10-11 are directed to method and apparatus for analyzing a waveform data, wherein a particular type of waveform is first designated from multiple different types of waveforms, after which the designated waveform is subject to a filter process for removing

unwanted frequency components. Finally, the envelope of the filtered waveform is analyzed to determine deviding positions of the waveform data.

Neither Yamada nor Miyake contain any disclosure of designating a particular type of waveform from amongst a plurality of waveforms. Instead, the Yamada reference discloses only detecting the number of beats in a music piece by extracting a waveform of a low-frequency component from the input audio signal and detecting a peak value of the low-frequency component's waveform to determine a predetermined time period of the waveform. Similarly, relevant parts of Miyake simply discloses determining, via guide tapping, an average section corresponding to one beat and detecting a beat position on the basis of peak value exceeding a predetermined threshold. No mention is made in either reference towards the feature of designating a particular type of waveform.

With respect to Claims 3-7, 9, and 12, neither reference contain any disclosure of calculating a differential value of the envelope of a waveform that is detected as having been subject to a filter process, and determining dividing positions of the waveform based on such calculations. Rather, Fig. 3 of Miyake simply shows detecting a beat position, and certainly does not suggest calculating a differential value of the envelope of the waveform.

Regarding Claims 13-17, 23, and 25, the cited references do not contain any disclosure of detecting a plurality of rise positions and analyzing the rise positions to thereby extract one particular rise position as a dividing point of the original waveform data. Rather, Miyake simply discloses using the human ear to effectuate a guide tapping control method in order to determine a reference time width for a given beat, the time width being later used by a CPU to detecting the timing of that beat (See Col. 8. lines 49-68, and Col. 9, lines 43-52). No mention is made by either Yamada or Miyake as to analyzing a plurality of rise portions of the original waveform data and then extracting one rise position as a dividing position. Similarly, with respect to Claims 18-22, 24, and 26, neither reference contain any disclosure of analyzing one or more rise positions to determine a dividing position of the original waveform data.

Accordingly, Applicants respectfully submit that amended Claims 1-26 are not anticipated by or obvious in view of Miyake or Yamada, either alone or combined.

In view of the foregoing, Applicants respectfully submit that all of the pending claims are in condition for allowance. Reconsideration and reexamination of the claims, as amended, are respectfully requested, and an early allowance is solicited. If the Examiner believes it would further advance the prosecution of the present application, he is respectfully requested to contact the undersigned attorney.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 393032030300.

Respectfully submitted,

Dated: July 3, 2003

By: _____

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 1, 3, 10, 12, 13, 18, 25-27, 40-42, and 47 have been amended in the following manner:

1. (Amended) A waveform data analysis method comprising:

a step of designating a waveform type from among a plurality of waveform types and performing a filter process for removing, from original waveform data, a predetermined frequency component corresponding to the designated waveform type [components of a predetermined frequency band from original waveform data]; and

a step of determining dividing positions of the original waveform data on the basis of envelope levels of the waveform data having been subjected to said filter process.

3. (Amended) A waveform data analysis method comprising:

a step of performing a filter process for removing components of a predetermined frequency band from original waveform data;

a step of detecting an envelope of the waveform data having been subjected to the filter process;

a step of calculating differential values of the envelope of the waveform data detected by said step of detecting; and

a step of determining dividing positions of the original waveform data on the basis of [differentiation] the differential values of the envelope [detected by said step of detecting] calculated by said step of calculating.

10. (Amended) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

designate a waveform type from among a plurality of waveform types;

read out the original waveform data from said storage device and perform a filter process for removing, from the original waveform data, a predetermined frequency component corresponding to the designated waveform type [components of a predetermined frequency band from the original waveform data]; and

determine dividing positions of the original waveform data on the basis of envelope levels of the waveform data having been subjected to said filter process.

12. (Amended) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

read out the original waveform data from said storage device and perform a filter process for removing components of a predetermined frequency band from the original waveform data;

detect an envelope of the waveform data having been subjected to the filter process;

calculate differential values of the envelope of the waveform data detected; and

determine dividing positions of the original waveform data on the basis of [differentiation of the detected envelope] the differential values of the enveloped calculated.

13. (Amended) A waveform data analysis method comprising:

a step of determining presumed beat positions in original waveform data;

a step of detecting rise positions in the original waveform data within predetermined ranges corresponding to the presumed beat positions determined by said step of determining, wherein one rise position is detected for each of the predetermined ranges; and

a step of analyzing the rise portions of the original waveform data, detected by said step of detecting, and thereby extracting [any] one of the rise positions[, detected by said step of detecting,] as a dividing position of the original waveform data.

18. (Amended) A waveform data analysis method comprising:

a step of detecting a plurality of rise positions in original waveform data; [and]

a step of selecting one or more rise positions [rise position] from among [one or more] the plurality of rise positions detected by said step of detecting within a predetermined range of the original waveform data; and [extracting the selected rise position as a dividing position]

a step of analyzing the one or more rise positions, selected by said step of selecting, and thereby determining dividing positions of the original waveform data, wherein one rise position is detected for each of the predetermined ranges.

25. (Amended) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

determine presumed beat positions in the original waveform data;

detect rise positions in the original waveform data within predetermined ranges corresponding to the determined presumed beat positions; and

analyze the detected rise portions of the original waveform data and extract any one of the detected rise positions as a dividing position of the original waveform data.

26. (Amended) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

detect a plurality of rise positions in the original waveform data; [and]

select one or more rise positions [rise position] from among [one or more] the plurality of rise positions detected within a predetermined range of the original waveform data; and

analyze the one or more selected rise positions and thereby determine dividing positions [extract the selected rise position as a dividing position] of the original waveform data.

27. (Amended) A waveform data analysis method comprising:

a step of reproducing automatic performance information;

a step of storing waveform data in parallel with reproduction of the automatic performance information; and

a step of storing a series of synchronization control data indicative of [relationship in processing timing between the automatic performance information and the waveform data] timing relationship between an automatic performance to be executed successively and waveform data to be sampled successively, in correspondence with storage of the waveform data.

40. (Amended) A waveform data analysis apparatus comprising:

a storage device;

a reproduction device that reproduces automatic performance information;

an input device that inputs waveform data to be stored into said waveform data analysis apparatus; and

a control device coupled with said storage device, said reproduction device and said input device, said control device being adapted to:

store the waveform data in said storage device in parallel with reproduction of the automatic performance information, and perform control to store, in said storage device, a series of synchronization control data indicative of [relationship in processing timing between the automatic performance information and the waveform data] timing relationship between an automatic performance to be executed successively and waveform data to be sampled successively in correspondence with storage of the waveform data.

41. (Amended) A waveform data processing method comprising:

a step of dividing original waveform data into a plurality of [sections] partial waveform data; [and]

a step of adding waveform data of an additional section to each of the partial waveform data [an end of a selected one of the sections] divided from the original waveform data by said step of dividing, the waveform data of the additional section attenuating, with passage of time, from an initial value equal to an envelope level at [the end of the selected section] an end of a corresponding one of the partial waveform data; and

a step of storing, in a memory, each of the partial waveform data having the waveform data of the additional section added thereto.

42. (Amended) A waveform data processing method as claimed in claim [1 which] 41, further comprises a step of detecting an attenuation rate of the original waveform data in the selected section, [and] wherein the waveform data of the additional section are imparted with attenuation characteristics based on the attenuation rate detected by said step of detecting.

47. (Amended) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

divide original waveform data into a plurality of [sections] partial waveform data; [and]

add waveform data of an additional section to [an end of a selected one of the divided sections] each of the partial waveform data, the waveform data of the additional section attenuating, with passage of time, from an initial value equal to an envelope level at [the end of the selected section] an end of a corresponding one of the partial waveform data; and

store, in a memory, each of the partial waveform data having the waveform data of the additional section added thereto.